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National Cave and Karst Research Institute—Progress in the First Two Years

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Abstract

Congress mandated the establishment of the National Cave and Karst Research Institute in October 1998 to further the science of speleology by facilitating research, to enhance public education, and to promote environmentally sound cave and karst management. Considerable progress has been made during the tenure of the Interim Director (2000-2002) toward making the Institute operational. The scope of operation has been defined, and the organizational structure has been designed and approved. Numerous informal partnerships have been formed and formal cooperative agreements are being negotiated and signed. Federal and state matching funds for operating the Institute have been appropriated and staff recruitment is beginning. Initial funding for a building has been appropriated and the design is being discussed. Several research, inventory, and informational projects have been initiated.

BACKGROUND

Congress mandated the establishment of the National Cave and Karst Research Institute in October 1998 (Public Law 105-325) under the direction of the National Park Service. The Act stipulated that the Institute will be located in the vicinity of Carlsbad Caverns National Park in New Mexico (but not inside Park boundaries), and that the Institute cannot spend Federal funds without a match of non-Federal funds.

The mission of the Institute is to further the science of speleology by facilitating research, to enhance public education, and to promote environmentally sound cave and karst management. The goals of the Institute are to:

- Further the science of speleology through coordination and facilitation of research.
- Provide a point-of-contact for dealing with cave and karst issues by providing analysis and synthesis of speleological information and serving as a repository of information.
- Foster partnerships and cooperation in cave and karst research, education, and management programs.
- Promote and conduct cave and karst educational programs.
- Promote national and international cooperation in protecting the environment for the benefit of caves and karst landforms and systems.

- Develop and promote environmentally sound and sustainable cave and karst management practices, and provide information for applying these practices.

PROGRESS IN ORGANIZING AND FUNDING

Key activities during the interim period (2000-2002) were defining the scope of operation, designing an organizational structure, forming partnerships, finding funding sources and a physical facility, and defining research needs. Considerable progress has been made in all these areas toward making the Institute operational.

The Institute will require about 12 employees to fully accomplish the goals. Those include the lead positions of Director, Science Coordinator, Education Coordinator, and Information Coordinator, and support staff under their direction. Voluntary advisory boards made up of representatives from a range of disciplines and organizations will play an important role in guiding the scientific and educational undertakings of the Institute.

The Institute staff will not conduct research but will guide, focus, and encourage research through grants and partnerships. A primary function of the Institute will be to accumulate and organize data and information to make it accessible to investigators and for the Institute staff to use for synthesis of information on

regional and national scales. The Institute will encourage focused research and studies in caves and karst systems so that a more coherent and unified body of knowledge can emerge. The Institute will work toward accumulating funding that can be distributed to researchers through a grant program that focuses on national priorities in cave and karst research.

Partnerships with cave and karst interest groups, agencies, and organizations are critical to the success of the Institute, and to create a national and international focus on research, education, and information dissemination for better understanding and management of cave and karst resources. The Interim Director made numerous presentations at professional and special meetings to encourage dialog on formation of the Institute, as well as meeting individually with many representatives of interest groups, organizations, and agencies. More than a dozen articles or abstracts were published in venues such as *Environmental Geology*, *GSA Today*, and symposia proceedings to publicize the formation of the institute to a wide audience. A web site (www2.nature.nps.gov/nckri) was launched to provide another avenue of communication to and from a wide range of potential partners.

The Institute received its first Federal appropriation for fiscal year 2002 to match the State funding appropriated to the New Mexico Institute of Mining and Technology (NMT) in support of the Institute. The Institute, the City of Carlsbad, and NMT are establishing a memorandum of understanding to define their partnership roles in establishing and managing the Institute. NMT is using their appropriation to create two new positions in cave and karst science: a hydrogeologist in the Bureau of Geology and Mineral Resources stationed in Carlsbad working in close association with the Institute, and a faculty position in cave and karst studies in the Department of Earth & Environmental Science in Socorro, serving as a liaison with the Institute.

The Institute, the City of Carlsbad, and NMT will constitute the founding members of the Institute's Management Advisory Board; additional members will be added after the Board is officially chartered as a governmental advisory board. Additionally, a Science and

Education Advisory Board will be chartered to review and oversee the Institute grant process. A Federal Advisory Board will continue as an extension of the Federal Working Group that has been assisting the Interim Director in the interim period of the Institute.

Temporary office space and clerical support will be provided for the Institute during initial staffing through a partnership agreement between the Institute and New Mexico State University in Carlsbad. The New Mexico State legislature has appropriated initial funds to construct a building in Carlsbad for the Institute to occupy. The Institute, the City, and NMT are jointly working on funding and designing a building for the Institute.

A 5-year cooperative agreement has been negotiated with Western Kentucky University (WKU) so that collaborative projects can be easily initiated with any of their several departments related to cave and karst studies.

PROJECTS

The Institute currently is sponsoring and participating in some initial projects that will provide useful products and will help publicize the Institute.

- The Institute and the Karst Waters Institute (KWI) are collaborating to produce a booklet entitled *A Cave and Karst Management Handbook for America's Protected Lands*. Associates of KWI and staff of the National Park Service (NPS), Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (FWS), and U.S. Forest Service (USFS) are contributing written sections. The Institute and FWS provided funding for KWI to edit, publish, and distribute the booklet. The booklet, anticipated to be completed in late 2002, can be used as a handbook for resource managers to comply with the requirements of the Cave Resources Protection Act, as a source of information for interpreters, and as a training resource.
- The Institute, NPS, and U.S. Geological Survey (USGS) are collaborating to produce a USGS Circular (a magazine-style publication) on the topic of cave and karst science, resource management and research needs in the Federal agencies. In addition to

the Institute and USGS, sections of the report are being written by BLM, FWS, USFS, and the Environmental Protection Agency. Authors are contributing their writing time, the Interim Director is editing and compiling the publication, and USGS is funding the cost of preparation, printing, and distribution in late 2002.

- The Institute and USGS are working closely to organize a program to produce an improved national karst map and an associated web-based network of karst information. Federal and State agencies, the speleological community, and academia have repeatedly expressed the need for an accurate and detailed national karst map to better understand the distribution of soluble rocks in the United States. Maps at a variety of scales are needed to educate the public and legislators about karst issues, to provide a basis for cave and karst research, and to aid Federal, State, and local land-use managers in managing karst resources. The Institute is in a position to coordinate the united efforts of a number of groups in a program of truly national scope. USGS will compile karst maps of each state into a national map by working with the states to establish standards and consistent digital products, and will facilitate the digital compilation and production of the national karst map. The Institute will establish a web-based network of karst information that was used to build the national map.
- The Institute provided partial funding to publish a book compiled by the Denver Museum of Nature and Science, titled "Vertebrate Paleontology of Pleistocene Cave Deposits in North America."
- The Institute provided partial funding to publish a book compiled by the National Speleological Society, titled "Cave Conservation and Restoration."
- Under the cooperative agreement with WKU, a nationwide exploratory survey of DNA extracted from cave sediments will be conducted through the WKU Biotechnology

Center. Caves in different climatic, geologic, and geographic settings may have diverse and variable bacterial communities; however, the natural microbial makeup of caves is unknown and uninventoried on a broad scale. DNA fragment profiles of bacteria in cave sediments will be determined for a general view of community diversity. Initially, 12 caves across the country on federal, state, and private land are being identified for sampling 4 times over a 1-year period. The number of caves sampled will be increased as additional funds become available. The information will be made available on the Internet to any interested research scientists.

- WKU has, over the last several years, developed a graduate program tailored to the needs and schedules of NPS cave and karst resource management staff who wish to further their educational background. Under the cooperative agreement with WKU, the Institute is supporting this program to allow more students access to the benefit of advanced education.

PLANS FOR FISCAL YEAR 2003

A nationwide announcement will be issued in summer 2002 to recruit the permanent Director for the Institute. The Director should report to Carlsbad early in fiscal year 2003. If additional operating funds are appropriated for 2003, additional positions will be recruited, probably including the Science Coordinator and administrative staff.

When the Management Advisory Board and the Science and Education Advisory Board charters are approved, a process to solicit members will be announced in the Federal Register. Members will be appointed by the Secretary of the Interior.

If additional operating funds are appropriated for 2003, a formal grant process can be initiated.